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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,568	03/29/2004	Robert E. Carlson	14095.1USI1	4101

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EXAMINER	
LUNDGREN, JEFFREY S	
ART UNIT	PAPER NUMBER
1639	
MAIL DATE	DELIVERY MODE
07/22/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/813,568	CARLSON, ROBERT E.	
	Examiner	Art Unit	
	JEFFREY S. LUNDGREN	1639	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 April 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,10,11,14,15 and 83-146* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,10,11,14,15 and 83-146* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *November 14, 2007; February 26, 2008; July 29, 2008; September 17, 2008; and May 18, 2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

Amended claims 1-3, 10, 11, 14, 15 and 83-146, are pending in the instant application and are the subject of the Office Action below.

Information Disclosure Statement

The information disclosure statements (IDS) submitted on November 14, 2007; February 26, 2008; July 29, 2008; September 17, 2008; and May 18, 2009; have been considered by the Examiner. The submissions are in compliance with the provisions of 37 CFR § 1.97. Enclosed with this Office Action are return copies of the Forms PTO-1449 with the Examiner's initials and signature indicating those references that have been considered.

Previous Grounds of Rejection – Withdrawn in view of Amendment

The previous rejections of the claims raised in the Office Action are withdrawn in view of Applicant's amendments to the claims. Applicant's amendment introduces the new limitation where there is only permitted a single amino acid derivative in the building block, namely, the framework of the building block, and thereby overcomes the previous rejection based on Balch, New and Still.

Claim Rejections - 35 USC § 102(e)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

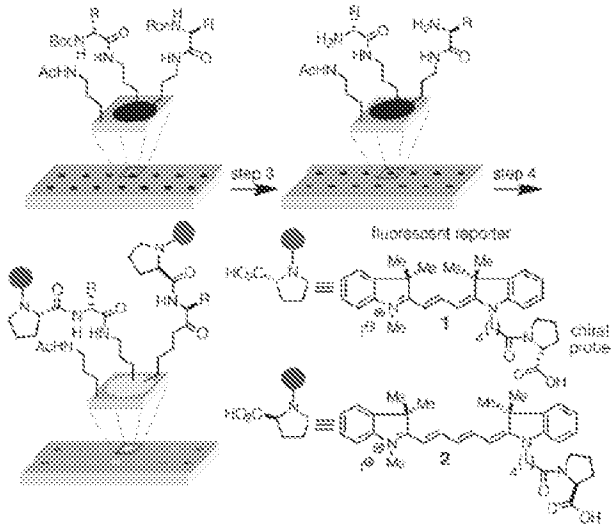
> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 10, 11, 14, 15 and 83-109 and 112-146 are anticipated by Shair:

Claims 1-3, 10, 11, 14, 15 and 83-109, 112-142 and 146, are rejected under 35 U.S.C. § 102(e) as being unpatentable over Shair *et al.*, U.S. Patent Appl. Publication No. 2002/0090728, published on July 11, 2002.

Applicants' claimed invention is directed towards a method for making an array, the array comprising a plurality of array elements, each array element comprising a unique binary mixture of at least two building blocks (*e.g.*, array element 1 [A,B]; array element 2 [A,C]; …array element n [X,Y]). Each of the building blocks comprises a framework and at least one recognition element, and has the amended limitation that excludes building blocks with more than a single amino acid derivative. The building blocks read on single amino acid residues derivatized with a large range of organic scaffolds, and therefore each array element reads on a mixture or amino acid residues with different organic scaffolds, or different recognition elements (*i.e.*, the building block molecules can have the same framework but a different series of at least one recognition element between each other).

Shair is directed towards the use of an array of organic compounds formed from various mixtures. The array of Shair comprises multiple array elements, each array element comprising two distinct compounds, each compound comprising a different amino acid (D-form and L-form amino acids), and also comprising a different organic recognition element (e.g., Cy3 and Cy5). Shair illustrates this concept in Figure 4:



In this figure, there is shown a plurality of array elements on a glass microscope slide, and a blow-out of a single array element comprising two distinct compounds. Of the two distinct compounds, Shair teaches amino acid derivatives which are encompassed by the claimed framework, and the attached fluorophores (*e.g.*, the claimed substituted alkyl, cycloalkyl, hetercycle, etc.) and/or the amino acid side chains that fall with the claimed recognition elements (e.g., alkyl and aryl, either of which may be substituted – see the proline, serine and phenylalanine in Figures 12 and 14). Shair shows that any of the array elements could be considered the lead artificial receptor, and show varying the ee ratios to obtain the fastest/tightest binders (see Figures 12 and 14, and description thereof), and there are multiple sets and subsets of building blocks.

As in claims 1-3, 10, 11, 14, 15, 83-109, 112-142, 145 and 146, the amino acid side chains (e.g., the proline ring feature, the leucine alkyl chain, the phenylalanine, or any of the naturally occurring amino acids) and the various Cy3 or Cy5 dyes, meet the limitations of the two recognition elements for the first and second building blocks, and the framework of the building blocks, and is shown to be attached with various linker molecules, including alkylcarbonyl groups (Shair, paragraph 0014), and is carried out with printing or pin spotting (paragraph 0010).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. § 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-3, 10, 11, 14, 15 and 83-146 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shair *et al.*, U.S. Patent Appl. Publication No. 2002/0090728, published on July 11, 2002, in view of Heller *et al.*, U.S. Patent No. 5,632,957, issued on May 27, 1997.

The teachings of Shair as they apply to the rejected claims 1-3, 10, 11, 14, 15 and 83-109, 114-142 and 146 are detailed above, and are hereby incorporated into the instant rejection.

Although Shair teaches the use of a fluorescent detection system, Shair does explicitly teach the claimed surface plasmon resonance surface of quartz crystal microbalance surface as in claims 110, 111, 143 and 144.

Heller teaches a system for performing molecular biological diagnosis, analysis and multi-step and multiplex reactions utilizes a self-addressable, self-assembling microelectronic system for actively carrying out controlled reactions in microscopic formats. These reactions include most molecular biological procedures, such as nucleic acid hybridization, antibody/antigen reaction, and clinical diagnostics (see Abstract). Heller states:

> "***Many alternatives* to the detection of hybridized DNA by fluorescence *exist***. Most of the alternative techniques also involve modification of capture or target or reporter DNA probes with reporter groups that produce a detectable signal. A few of these techniques based on purely physical measurements do not require reporter groups. These alternative techniques are catalogued as follows: (1) Linear Optical Methods including fluorescence, time modulated fluorescence, fluorescence quenching modulation, polarization selective fluorescence, absorption, specular reflectance, changes in index of refraction, ellipsometry, ***surface plasmon resonance detection***, chemiluminescence, speckle interferometry and magneto-optic Kerr effect; (2) Nonlinear Optical Methods including second harmonic generation, third harmonic generation, parametric mixing, optical heterodyne detection, phase conjugation, soliton damping and optical Kerr effect; (3) Methods Based on Thermal Effects including differential scanning calorimetry, multifrequency differential scanning calorimetry, and differential thermal analysis; (4) Methods Based on Mass Changes including ***crystal microbalances***, cantilever microbalances, surface acoustic waves and surface Love waves; (5) Electrochemical Methids including amperometry, coulometry, voltammetry, electrochemiluminescence, charge transfer in donor-acceptor complexes and surface impedance spectroscopy; and (6) Radioactivity Detection Methods using labeled groups."

Heller, col. 19, lines 15-42.

One of ordinary skill in the art would have had a reasonable expectation of success in arriving at the invention as claimed because each of Shair and Heller are directed to the use of chemical-based sensor platforms. One of ordinary skill in the art would have recognized the interchangeable use of various detection platforms, such as the surface plasmon resonance platfrom and the quartz crystal microbalance as taught by Heller, because these systems are well-established alternatives to fluorescence based systems, and/or yield predictable results. Therefore, the invention as a whole was *prima facie* obvious at the time it was invented.

Conclusions

No claim is allowable.

Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

If Applicants should amend the claims, a complete and responsive reply will clearly identify where support can be found in the disclosure for each amendment. Applicants should point to the page and line numbers of the application corresponding to each amendment, and provide any statements that might help to identify support for the claimed invention (*e.g.*, if the amendment is not supported *in ipsis verbis*, clarification on the record may be helpful). Should

Applicants present new claims, Applicants should clearly identify where support can be found in the disclosure.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Jeff Lundgren whose telephone number is 571-272-5541. The Examiner can normally be reached from 7:00 AM to 5:30 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Christopher Low, can be reached on 571-272-0951. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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